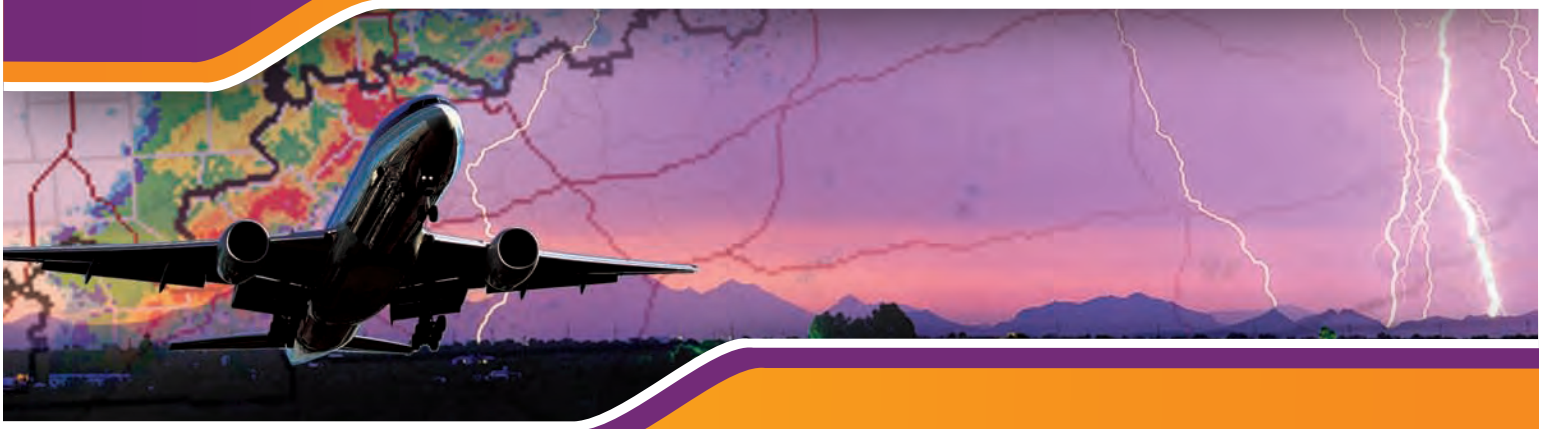

Meteorological and Aeronautical Information Services (AIS) Data Link Services and Applications Study

Aviation Safety Reporting System

March 2012

NASA ASRS (Pub. 64)

Meteorlogical and Aeronautical Information Services (AIS)
Data Link Services and Applications Study

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Executive Summary

Meteorological (MET) and Aeronautical Information Services (AIS) information is provided to the cockpit via data link through evolving technology. At the request of the Federal Aviation Administration (FAA), the Aviation Safety Reporting System (ASRS) initiated a study of incident reports citing the use of MET and AIS data link services or applications. The purpose of the study was to analyze and codify information from users of data link technologies as reported in ASRS incident reports.

The criteria for inclusion of incident reports in the ASRS MET and AIS Data Link Study was that reports were submitted by air carrier flight crews or general aviation pilots operating under FAR Part 121, 135 or 91 operations and included relevant data link usage in flight.

From February 2011 through December 2011, thirty-three ASRS incident reports met the study criteria and the reporters were successfully contacted. Reporter participation in completion of the (SQS) yielded 26 complete data sets. An initial target of 100 reports was intended for the purpose of this study. However, within the time frame of this study, twenty-six completed reports were obtained.

Data received through the voluntary, confidential and non-punitive reporting procedures of the ASRS may not represent the occurrence of all events related to MET and/or AIS data link. Pilots reporting to the ASRS tend to address the more serious events in aviation; therefore they are less likely to report the positive experiences or benign incidents. However, qualitative assessments of available records provide valuable insight on data link user interface and actual cockpit experiences related to data link weather or AIS information.

The incident reports within the study group were almost equally divided between passenger operations (50%) and personal flights (46%). The majority of reported data link incidents (69%) occurred during the enroute phase of the flights.

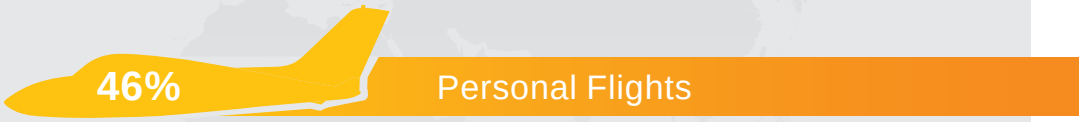
Pre-flight MET and AIS data link information appeared to be readily available and no issues were reported related to color-coding or symbology for the majority of reporters. Pre-flight MET data link information related to departure and destination weather was generally more accurate than enroute weather information.

Weather was a contributing factor in more than half of the reported incidents, either directly or in the form of increased workload. The actual weather encountered in an aggregate of all flight phases (departure, enroute and arrival) was either unexpected or received on short notice in 58% of the records.

The problems most often cited in regard to MET data link information were related to the accuracy and/or timeliness of the data. AIS information related to NOTAMs, TFR or Special Use Airspace appears to be more problematic than MET data link information. In the majority of AIS data link incidents, AIS information was made more difficult to use by its lack of airspace information or weather obscuration overlay features onto airspace data.

The majority of reporter written responses to open ended questions regarding MET data link usage were positive and indicated that the technology was a valued tool in the mitigation of adverse weather encounters.

As installation and usage of data link devices and services are expanded, continued collection and analysis of ASRS reports containing data link incidents may provide a more comprehensive review of event descriptions, contributors, and results.



(n=26) Records within study group

Introduction

This study was undertaken to evaluate pilot/flight crew observations regarding the use and effectiveness of data link technology in obtaining meteorological and aeronautical information services.

The Federal Aviation Administration (FAA) requested that that National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS) undertake a study of ASRS reports referencing meteorological and aeronautical information data link services and applications. ASRS reports are known to be a rich source of experiential data containing insights and information that cannot be obtained through other sources. ASRS has over 35 years experience and nearly a million safety incident reports, coupled with a reputation in the aviation community for protecting the identity of reporters under confidential provisions. The relationship between ASRS and the aviation community is built on that trust and the mutual desire of both parties to enhance the safety of our National Airspace System (NAS). The ASRS procedures allow contact with the reporting pilots and the ability to request their voluntary participation to acquire additional information concerning their report. In addition to the original ASRS incident report, the Meteorological and AIS Data Link Services and Applications Study provides further information obtained through a Supplemental Question Set (SQS). The supplemental questions were developed through collaborative efforts between NASA ASRS and FAA AJP.

The Meteorological and AIS Data Link Services and Applications Study was conducted through one of two methods; one was a written online supplemental question set and the other was participation via a telephone discussion. One hundred percent of the participants chose to respond online.

The SQS as an addition to an initial report provides the ASRS a more detailed account of the incident by including information directly related to the study focus that would otherwise not be described. All responses were voluntary.

Objectives

(A) Develop an understanding of the data link applications most often used.

(B) Develop an understanding of how pilots used data linked weather either to make better decisions or potentially make poor decisions.

(C) Determine what weather sources were most often used to obtain weather information.

(D) Determine user interface issues concerning graphical interpretation to include display systems, symbology, download delays, and data labeling.

Approach

Scope

Reports included in the study were required to meet the following criteria:

(A) Flight crew reports

(B) Air Carrier and General Aviation (121/135/91) flight operations, including air ambulance

(C) Description provided states that meteorological and/or AIS data link services via data link was received and used.

Supplemental Question Set (SQS) Development and Data Collection

In February 2011, ASRS Expert Analysts started identifying candidate reports from the incoming report flow. ASRS also conducted focused outreach activities to stimulate data link reporting. Outreach activities included articles describing the study in various organizational publications, including: Aircraft Owners and Pilots Association (AOPA), Air Line Pilots Association (ALPA), Allied Pilots Association (APA) and the Coalition of Airline Pilots Association (CAPA). The article provided to AOPA was published in AOPA ePilot and eBrief, which reaches over 200,000 subscribers. ALPA FastRead is an online publication sent to all ALPA membership on the recipient list; at the time of publication, the list exceeded 45,000 pilots. APA represents the approximate 8,000 pilots of American Airlines. CAPA is an association comprised of nine airline pilot unions and over 28,000 pilots, and include SWAPA and USAPA, representing the pilots of Southwest Airlines and US Airways respectively.

The SQS was developed collaboratively through a series of meetings and conference calls between NASA ASRS and FAA AJP. Concentrated development efforts and extensive testing produced the final SQS. In July 2011, ASRS analysts began contacting reporters to invite their participation in the study. Over the course of the study, ASRS identified thirty-nine reports that met the scope, ASRS was able to make successful contact with thirty-three (85%) of those reporters. One hundred percent of the thirty-three reporters who were successfully contacted by an ASRS Expert Analyst were willing to share additional information concerning their incident and experiences; twenty-six completed the SQS (79% response rate). All data was treated confidentially and any details that could identify individuals or organizations were removed to be consistent with ASRS established policy and procedure.

There were two sets of data compiled for this study. One was the ASRS data analysis accomplished by ASRS Expert Analysts using the standard ASRS Coding Form and the other was the data obtained through voluntary SQS participation. Both were necessary to complete the study and create a single data record for each incident contained within the study. A copy of the SQS along with the aggregated data summaries from both the ASRS Coding Form and the SQS can be found in the Appendices listed below:

Appendix A contains the final SQS used for this study. There are six sections in this SQS: Section A: General Demographics, Section B: Preflight, Section C: In-flight, Section D: Data Link Weather/AIS Information, Section E: Consequences and Contributing Factors and Section F: Suggestions and Observations.

Appendix B contains a comprehensive summary of the questions contained in the SQS including reporters' observations and recommendations for future data link operations.

Appendix C contains selected fixed fields from the ASRS Coding form that have been coded by ASRS Expert Analysts based on the information provided in the ASRS reporting form. Along with the coding form fixed fields is an ASRS Expert Analyst written report synopsis for each incident report.

Contained within this study are twenty-six unique incidents. A single event reported to the ASRS is referred to as an "incident." The figures and tables presented will cite the number of completed answers or responses from the total data set of 26. Some questions provided opportunities for multiple responses. A "not mutually exclusive" label will indicate this question type.

Findings

Event Information

All twenty-six qualifying incidents occurred between February 2011 and December 2011.

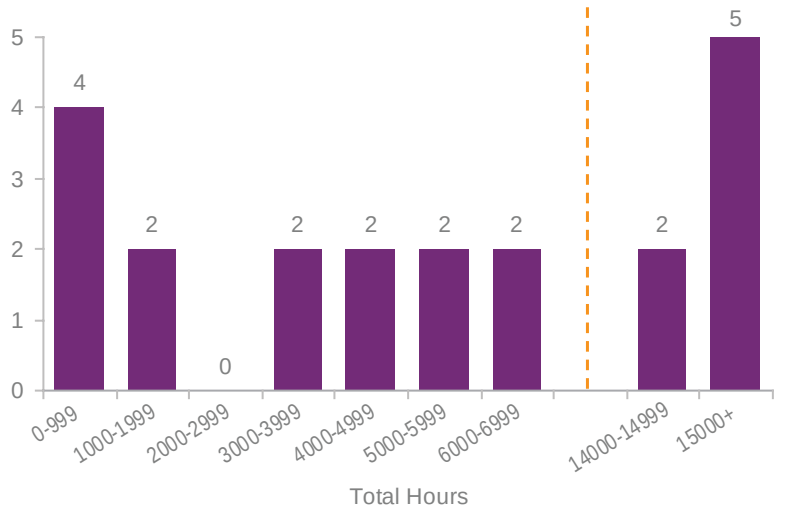
Pilot Qualifications

ASRS summarized pilot qualifications for study participants based on their responses in original ASRS incident report submission. Certificates and rating information on twenty-four of the reporters (92%) was provided. Sixteen reporters (67%) stated they held an Air Transport Pilot (ATP) certificate, four were Commercial pilots (17%) and an additional four held Private Pilot certificates (17%). All twenty-four pilots who reported their certificate and ratings were instrument rated. Three of the Commercial pilots (75%) and six of the ATP's (38%) reported being multiengine qualified as well. None of the Private pilots reported multiengine ratings.

Pilot Experience

Flight time was reported in 21 incidents (81%), averaging 7,908 hours of total flight time. The lowest total flight time reported from the pilot group was 650 hours (see **Figure 1**).

Figure 1. Total Flight Time *(n=21)*



Aircraft Type and Equipment

The aircraft type was fairly evenly split between transport and light single-engine aircraft. Interesting, but not necessarily surprising, was the similarity of data link capabilities throughout installed equipment, both in communication and navigation/flight management resources.

Pilots utilized nearly all communication and navigation equipment on board their aircraft. However, when looking further into the weather detection equipment usage (C.2), only eleven out of sixteen aircraft equipped with weather data link (69%) utilized that resource. The five reporters that did not obtain onboard weather via data link did use data link services in-flight to obtain AIS information, such as TFRs or METARs. All five of these reports were general aviation aircraft. **Table 1** (page 6) presents the results of SQS Questions C.1 and C.2.

Mission, FAR Part and Operator Type

The reporter's description of the type of flight being conducted at the time of the incident is referred to as the mission. As shown in **Figure 2**, out of the twenty-six incidents, thirteen were reported as passenger missions, twelve as personal flights and the remaining incident was a ferry flight. Additionally, fourteen of the flights (54%) were operated under FAR Part 91, with the remaining eleven governed by FAR Part 121.

Figure 2. Mission *(n=26)*

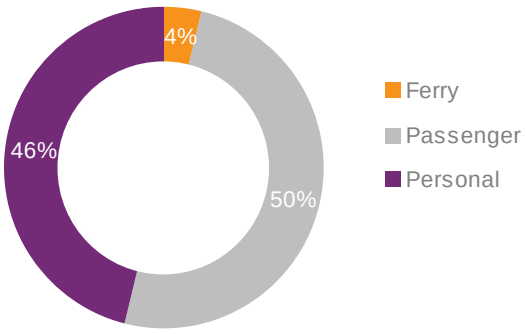


Table 1. Aircraft Equipment, Equipped/Used and Unserviceable (SQS, C.1 & C.2)

C.1 What type(s) of navigation and communication equipment were onboard the aircraft at the time of the incident, did you use it, and if equipped, was any of it UN-serviceable/deferred? (check all that apply)

Communication			
Equipment	Equipped	Used	Unserviceable
Single VHF Transceiver	1	1	—
Dual VHF Transciver	20	18	—
Combination NavCom	13	11	—
HF Transceiver	10	4	1
ACARS	12	12	1
Satellite Phone	9	3	—
Cell Phone	3	0	1
Data Link	17	15	2
Other (specify)	3	2	—
Navigation/Flight Management			
Equipment	Equipped	Used	Unserviceable
VOR Receiver(s)	16	7	—
ADF	13	2	—
DME	—	—	—
FMS/FMC	16	14	—
INS/IRS	9	8	—
Integrated Area Navigation	8	8	—
Moving Map/GPS	22	20	—
Other (specify)	2	2	—

C.2 What weather detection equipment, if any, was your aircraft equipped with during this incident?

Weather Detection Equipment			
Equipment	Equipped	Used	Unserviceable
Weather Radar	17	10	—
Lightning Detector/Stormscope	9	3	—
Weather Data Link	16	11	—
Predictive Windshear	12	5	—
Enhanced Vision System (EVS)	1	—	—
Other (specify)	1	1	—

Time of Day and Lighting

The time of day and lighting information was obtained through the original ASRS incident report. The majority of incidents happened between the hours of 6:01 AM to 12:00 PM and 12:01 PM to 6:00 PM (19 of 26 pilots reported). Lighting was most commonly reported as daylight.

Section A: General Demographics

The majority (69%) of incidents involving the use of meteorological or AIS data link occurred during the enroute phase of flight (**Figure 3**). Enroute events were then further differentiated between, domestic (13), oceanic (4) and remote area/polar routes (1) (A.2).

Section B: Preflight

Twenty-five of twenty-six pilots attempted to obtain weather and AIS prior to flight. SQS Question B.2 requested pilots to select all sources of preflight information utilized to obtain preflight weather data. **Figure 4** shows the wide variety of resources pilots used to obtain this information. Pre-flight meteorological and AIS data link information appeared to be readily available (B.4) and no problems related to color-coding or symbology were reported for the majority of reporters (B.3).

A comparison of weather obtained during pre-flight preparations and that encountered in-flight (B.7) is shown in **Table 2**. Pre-flight meteorological data link information related to departure and destination weather was generally more accurate than enroute weather information. Actual enroute weather was the same as data link forecast information in 58% of the incidents, but worse than forecast in 42%.

Figure 3. Flight Phase *(n=26)*

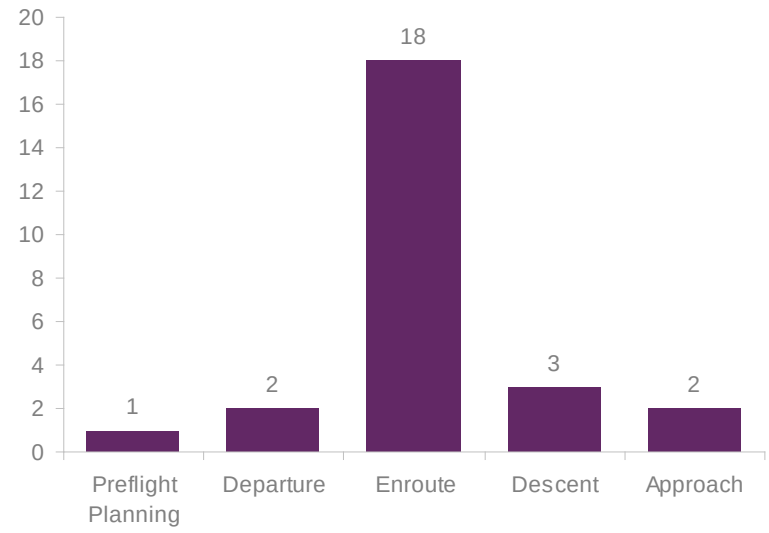
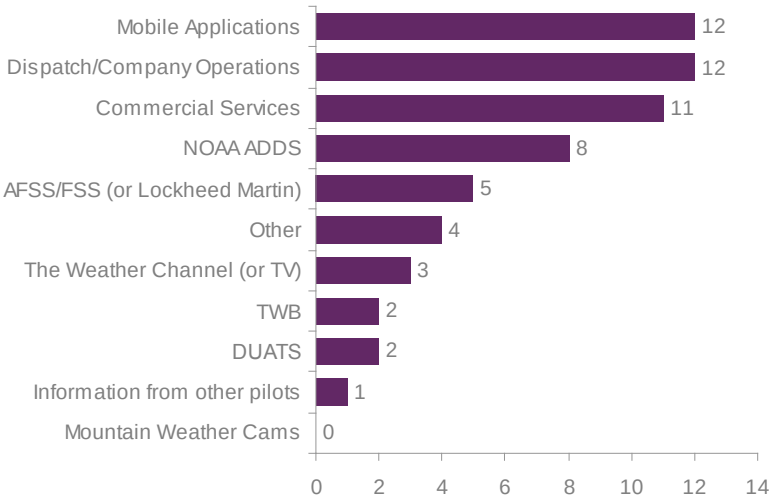


Figure 4. Preflight Resources Utilized *(n=26)*



**Not Mutually Exclusive. (Other includes: AOPA Weather, VFR day no weather required, ASOS/AWOS via the Internet, Anchorage Center Weather Broadcast)*

Table 2. Weather Encountered

	Better Than	Same As	Worse
Departure	0	26	0
Enroute	0	15	11
Destination	0	21	5

Figure 5. Weather Encounter as Contributing Factor to Incident *(n=26)*

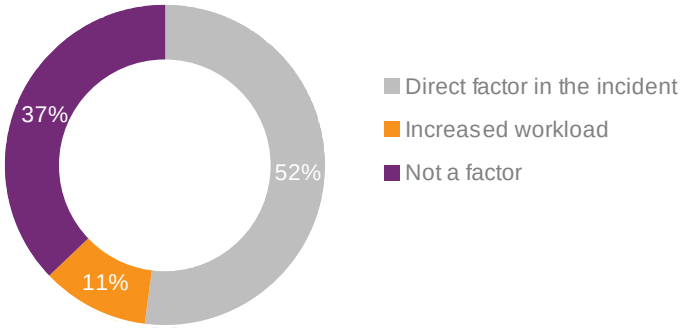


Figure 6. NOTAM/TFR/Special Use Airspace Issues *(n=15)*

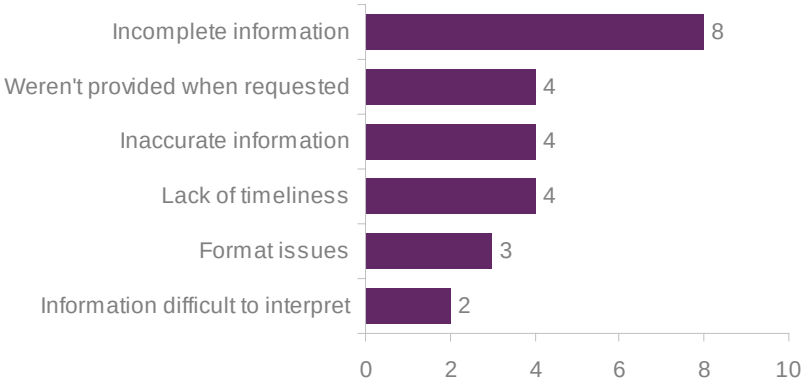


Figure 7. Data Link Format *(n=18)*

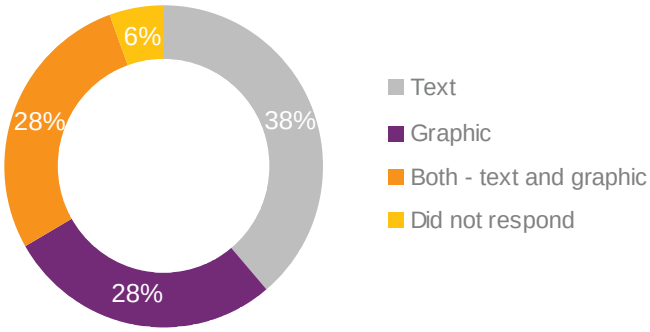
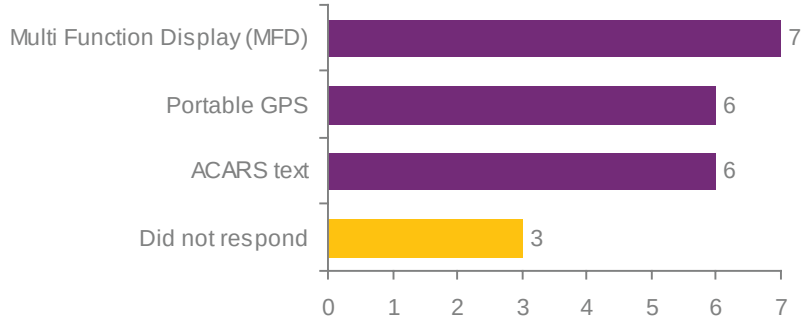


Figure 8. Cockpit Display Used *(n=18)*



**Not mutually exclusive.*

Section C: Inflight Weather Encounter

The actual weather encountered in all flight phases was either unexpected or received on short notice in 58% of the records. Weather was a contributing factor to the reported incident, either directly or in the form of increased workload, in 63% of the reported incidents (C.4, see **Figure 5**).

The problems most often cited in regard to meteorological data link information were related to the accuracy and/or timeliness of the data. AIS information related to NOTAMs, TFR or Special Use Airspace were used in 15 of the 26 data link incidents and described to be more difficult than meteorological data link information. In more than 50% of the responses, incomplete information was the most common issue encountered with AIS (C.6). **Figure 6** summarizes reporter issues with obtaining AIS information.

Section D: Data Link Weather / AIS Information

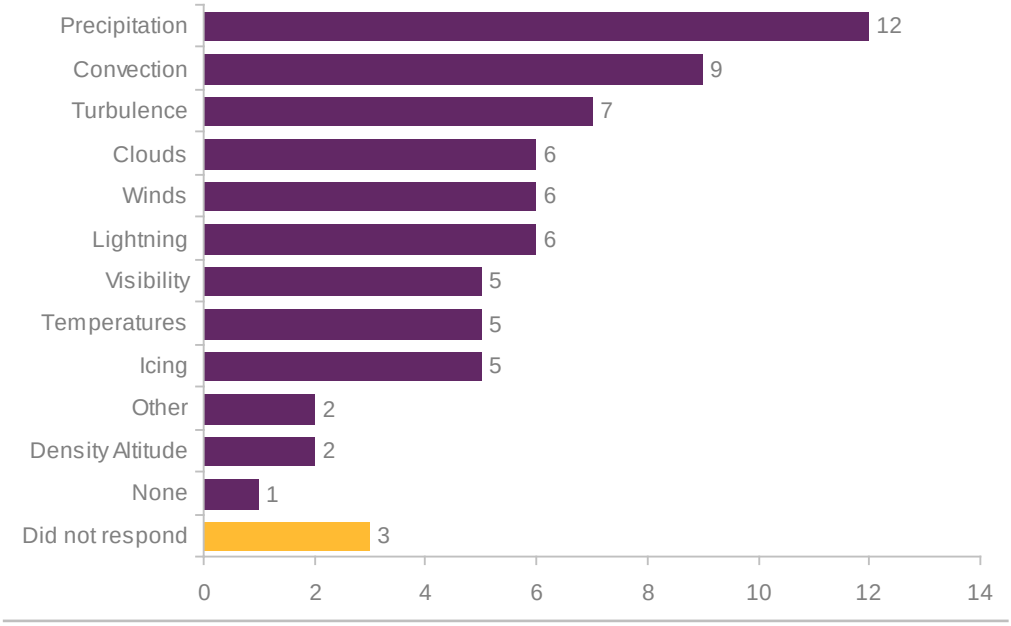
In 18 of the 26 reports (69%), pilots obtained data link weather or AIS information in-flight (D.1). All but one of the eighteen reporters who obtained data link information in-flight identified the format. **Figure 7** illustrates the data link format pilots were utilizing during the reported event (D.2).

Of the sixteen who identified their aircraft as equipped with weather data link (C.2), only eleven (69%) successfully utilized that resource.

The pilot responses to SQS Question D.3 are shown in **Figure 8**. Two reporters used both an installed multi-function display (MFD) as well as a portable GPS to obtain data link information. The most commonly used applications to obtain data link information were WxWorx (3) and XM Aviation Weather (5).

While comparing the actual weather encountered (C.3) with the weather available via data link resources (D.5), in all but one of the 18 incidents the weather encountered was the same as the reporter was able to view on the data link display. **Figure 9** shows the various weather phenomena obtained via data link resources.

Figure 9. Weather Information Obtained via Data Link *(n=18)*



**Not mutually exclusive. (Other includes: SIGMETs and PIREPs)*

Nine of the eighteen pilots (50%) confirmed their data link devices were capable of displaying signal integrity (D.11). In D.12, thirteen of the 18 were aware of the last time they had received data. Only two reporters described data coverage issues (D.13).

Of the eighteen reporters utilizing inflight data link information, only one reporter identified the physical positioning of the display as a concern (D.17). When asked more specifically about the positioning, the reporter selected “mounting concerns – e.g. increased rapid head movements” from the four choices available (D.18).

Event Anomaly

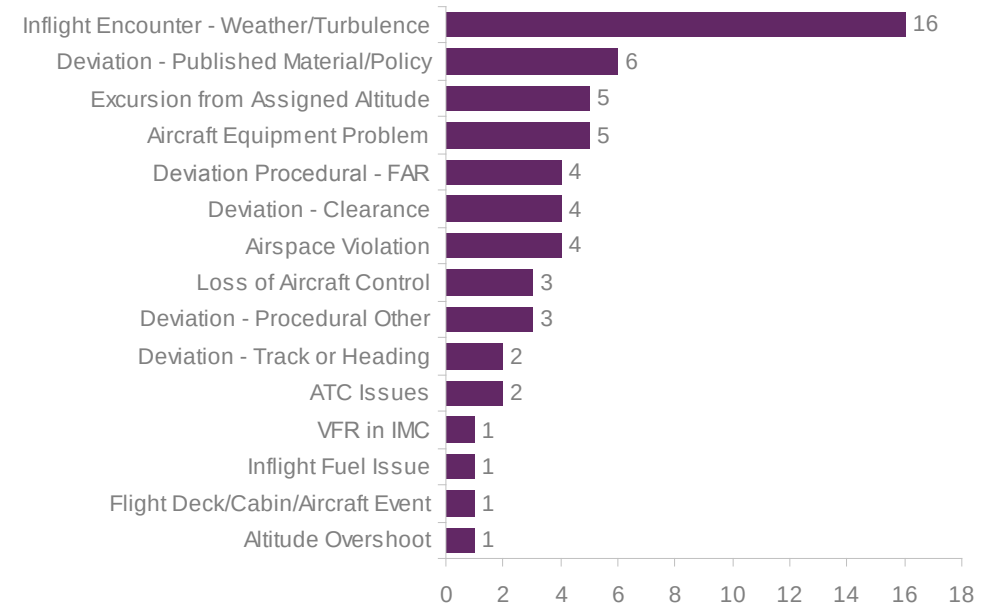
ASRS Expert Analysts code the event anomaly based on initial incident report submission. The anomaly field is not mutually exclusive, allowing the expert analyst to code up to six event types. Over half (62%, see **Figure 10**) of the events included in this study describe an in-flight encounter of either weather or turbulence. Five events additionally experienced an aircraft equipment problem.

Section E: Consequences and Contributing Factors

Seven of the twenty-six reports (27%) resulted in a diversion as a result of incomplete, inaccurate or misinterpreted weather/AIS information in-flight (E.2). Of the seven reported diversions, one pilot reports diverting after an approach to an airport was attempted.

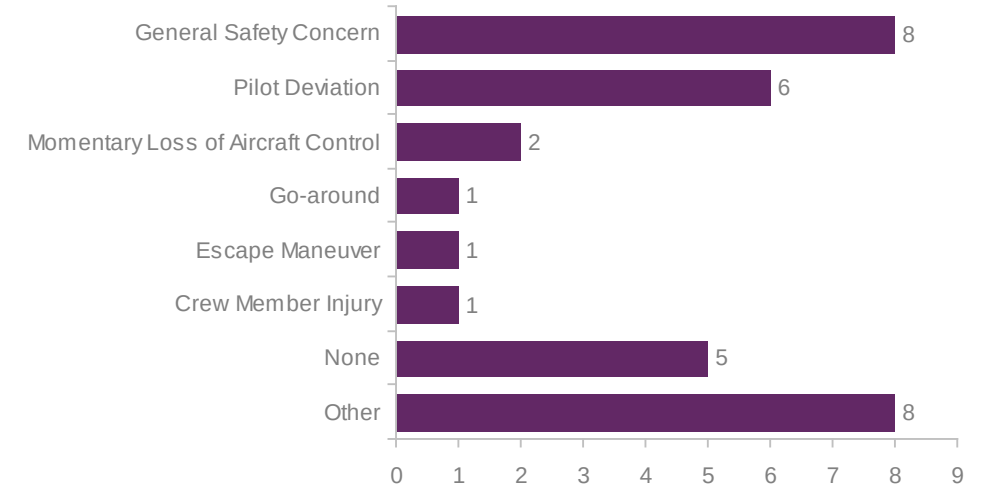
When asked if there was additional weather/AIS information available that was not accessible, ten reporters responded in the affirmative, eleven did not believe so and five reporters were unable to determine if they were not able to access all available information (E.4).

Figure 10. Anomaly *(n=26)*



**Not mutually exclusive.*

Figure 11. Consequences of Data Link Incidents *(n=26)*



**Not mutually exclusive.*

Factors other than weather/AIS that contributed to the reported events occurred in 15 of the 26 incidents (58%). A few of the contributory factors include: one instance of “Get-home-itis,” two aircraft equipment problems, and four related to company policy or procedures (E.6).

More general consequences of the weather data link incident are shown in **Figure 11** (E.7). Study participants were asked to select all applicable consequences from a predefined list of eleven potential consequences. Eight pilots stated that the incident resulted in a general safety concern. An “Other” selection allowed reporters to write-in their individual observation if the predefined list did not capture a consequence they encountered. Eight reporters chose to do this. “Other” responses include two incidents where the pilots

reported inadvertent penetration of airspace and two consequences related to Air Traffic Control vectors and routing. Another two pilots reported they lost the use of ACARS as a result of receiving worldwide Significant Meteorological Information (SIGMETs) rather than a specific location. A precautionary landing was made by one reporter to verify satellite accuracy and another simply conducted a precautionary diversion.

Overall, seventeen of the study participants (65%) responded that they believe enhanced weather/AIS information would have helped in weather avoidance decision-making (E.1).

Section F: Reporter Suggestions and Observations

In Section F of the SQS, the reporters answered 5 questions related to training, use of observational data, personal explanation of cause of event, preventative measures and the use of training in relation to data link services and applications.

Inclusion of observational data from previous flight crews or station personnel at ground locations was determined to be a potentially useful resource by 10 of the 24 respondents. Two reporters did not answer the question.

Due to the fact that the majority of reports involve a safety "incident," ASRS data is strongly related to negative experiences if something happened. However, the majority of comments from reporters on the use of MET data link information were positive. Responses to "General observations on obtaining weather/AIS via data link in-flight" (F.3) included such comments as:

- "An amazing addition to pilot comfort in weather assessment…" *(Report # 4)*
- "Indispensable for non-local flights…. Used for VMC as much as for IMC. Greatly increases utility of aircraft." *(Report # 7)*
- "In-flight satellite weather, I have used both WSI and WxWorx, is invaluable." *(Report # 16)*
- "Thanks to data link and advances in GPS (especially WAAS and moving maps), we now have the best tools I've seen for improving safety since I started flying in the 1960's." *(Report # 17)*
- "In general, it's much better to obtain weather info via data link than via traditional methods…" *(Report # 21)*
- "It's a great tool especially when planning a descent into a destination airport [where] weather is a consideration." *(Report # 22)*

Discussion

Qualified Incident Reporting

The number of relevant ASRS incident reports received during the project time frame (February 2011 through December 2011) may be indicative of limited availability of devices, seamless usability, and effectiveness of data link information.

Pre-flight Planning

All but one pilot who participated in this study attempted to obtain preflight weather information. The one pilot who did not obtain weather responded, "It was a VFR day, no weather was required." At departure time the weather was the same as received in the pre-flight preparations in all reported instances. However in 42% of the reported incidents, the weather enroute was worse than originally forecast. The intermittent reliability of accurate forecasts reiterates the importance of timely and accurate data link information. This may indicate the pilots who were able to successfully update their MET or AIS data in-flight with accurate information were less likely to encounter surprises in weather along their route of flight.

Data Link Event Information

One reporter commented, "We had viable weather backup plans, and consider this experience an example of the value of data link in aiding successful safe flight." *(Report # 4)*

Another reporter addressed obscuring of Special Use Airspace data by a weather overlay feature stated, "I focused too much on the graphic weather screens…The combined overlay (weather on same screen as navigation/airspace) is usually a GREAT and useful screen, but in this case it wasn't the best choice." *(Report # 8)*

Regarding the problem of interpreting weather information as "real time," a reporter attributed his mistake to, "My failure to accept the information as advisory and actually use it as a 'tactical' tool. I also failed to properly interpret and recognize the age of the data and its deficiency considering the rapid development of the air mass thunderstorms." *(Report # 22)*

MET vs. AIS Data Link

Negative comments regarding weather data link information primarily addressed the issues of "stale" or inaccurate data (F.3). One reporter commented, "The information displayed is several minutes old. If weather is changing quickly, data link should be used to avoid an area and not pick thru." *(Report # 26)*

Reporter experiences with AIS data link information tended to be negative. Often mentioned was the absence of restricted airspace information or obscuration of airspace data by a weather overlay feature.

Strategies Gathered from Reporters Comments

In Section F of the SQS, pilots were provided the opportunity to answer six questions. Four of these questions were open-ended text and asked reporters about their suggestions and observations.

The first of the two yes/no questions was whether each individual pilot felt additional simulator training would prevent a similar event in the future. Thirty-six percent did not feel additional training would be valuable (F.1). The second yes/no question asked about whether including observational data from ground personnel or previous flight crews would be useful. All but two of the participants responded to this question. Ten of the 24 (42%) who answered did feel the additional information would be helpful (F.2).

The remaining four questions in Section F summarize the reporter's event in their own words. "An amazing addition to pilot comfort in weather assessment, and easy choice of successful weather deviation in this case," stated one reporter when asked to provide a general observation on obtaining weather/AIS data link information in-flight (F.3). *(Report # 4)* Another reporter explained, "At the time of the incident the weather information was delayed. Right after the incident the update showed we had flown into a strong cell area." *(Report # 10)*

When asked a self-reflective question on why the incident occurred (F.4), one reporter confessed, "I focused too much on the graphic weather screens. Obviously the MFD had other screens that would have shown the airspace borders without any weather on them." *(Report # 8)* While another reporter attributes the incident to unreliable data, "I believe the winds we uploaded were corrupt/bad. I don't know why this happened and I don't know if the winds from six hours later were the same or better." *(Report # 18)*

The third write-in question asks the reporter what they would have done differently to prevent this incident (F.5). The last question is available for the reporter to provide any general comments. Responses to questions F.1 through F.6 are presented in Appendix B and provide a general assessment of each individual

event in the reporter's own words. When asked, "In retrospect, what would you have done differently to prevent this incident?" (F.5), pilots evaluated their actions. Comments include:

- "Went with my first instinct and deviated completely around the weather, which has always been my practice, if able." *(Report # 1)*
- "Revert to SATCOM or HF to obtain the info. But those methods are time consuming." *(Report # 2)*
- "Should have told ATC 'No, I won't go because of weather I am seeing on NEXRAD.' The fact other planes were being vectored through it should not have been a factor." *(Report # 16)*

Preliminary Conclusions

The summary of this study includes 26 ASRS reports and follow-up supplemental question sets. This has provided some results as reported here, but this is a small set of information and likely limited in providing the bigger picture of variability that might be present in a larger set of reports. The data contained within this data set reveals findings that indicate weather forecasts and weather encountered were regularly consistent. However, user settings on data link displays were mentioned in a few reporter responses. More information is needed to understand this issue. A larger set of data may provide additional information about these inconsistencies that may reside in the data link user community. Another identified issue is related to the availability and presentation of TFRs on data link displays. Future questions and a larger data set could be addressed to reveal additional concerns within the data link community on user interface settings and options for various display types.

Appendices A - C

Meteorlogical and Aeronautical Information Services (AIS) Data Link Services and Applications Study

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Appendix A

Example Supplemental Question Set (SQS)

ASRS Incident Reports on Meteorological & Aeronautical Information Services (AIS) Data Link Services and Applications

FINAL 5.0

Scope:

(a). Flight Crew reports only; no controller or dispatch reporting
(b). GA, and Air Carrier (121/135/91), to include air ambulance operations
(c). Must have received and used meteorological and/or aeronautical information services via data link (e.g., preflight or inflight)

Section A. - General Demographics

A.1 ..... Aircraft Make & Model: _____

A.2 ..... Flight Phase where incident occurred

- ○ Preflight planning
- ○ Airport surface operations
- ○ Departure
- ○ En Route – domestic
- ○ En Route – remote area / polar routes
- ○ En Route – oceanic
- ○ Descent
- ○ Approach
- ○ Landing

Section B. - Preflight

B.1 ..... Did you attempt to obtain weather and AIS information prior to your flight?

- ○ Yes *(Continue to Question B.2)*
- ○ No *(Skip to Question B.6)*

B.2 ..... If you answered "Yes" to Question B.1, what resources did you utilize to obtain pre-flight weather data?

- ☐ The Weather Channel (or other TV stations)
- ☐ (Automated) Flight Service Station / Lockheed Martin
- ☐ DUATS
- ☐ Commercial services (e.g., WSI, XM),
- ☐ Mobile applications (ForeFlight, FltPlan.com, PlaneBill, WingX, WeatherTAP, etc.)
- ☐ Transcribed Weather Broadcasts (TWB)
- ☐ Information from other pilots
- ☐ Dispatch / Company Operations
- ☐ NOAA's National Weather Center "ADDS" (Aviation Digital Data Service)
- ☐ Mountain Weather Cams
- ☐ Other (specify) _____

B.3 ..... If you obtained weather information from an aviation weather source or a public weather source (e.g., television), did you experience confusion between the variation of symbols and/or colors?

- ○ Yes
- ○ No
- ○ Not applicable

B.4 ..... Were any of your attempts to obtain preflight weather/AIS information unsuccessful?

- ○ Yes
- ○ No

B.5 ..... If you answered "Yes" to Question B.4 above, what were the reasons your attempts were unsuccessful?

Landline telephone / mobile telephone

- ☐ Did not know or were unable to find telephone or access numbers
- ☐ No telephone available/no signal
- ☐ No answer on telephone
- ☐ Telephone briefer did not have all requested information available
- ☐ Telephone briefer denied service
- ☐ Dispatch did not have all the requested information available
- ☐ Dispatch denied requested service
- ☐ Information provided via phone was too complex to copy

Computer / Smartphone / tablet computing device

- ☐ No online access available
- ☐ Could not connect online
- ☐ Could not maintain online connection
- ☐ Experienced difficulty with computer interface
- ☐ Did not have computer in my possession

Onboard data link equipment

- ☐ Data link equipment malfunction
- ☐ Not within coverage volume of service
- ☐ Other (specify)_____

B.6 ..... Why did you decide not to obtain pre-flight weather/AIS information?

- ☐ Did not believe pre-departure weather or AIS information was necessary for the intended flight
- ☐ Was intimidated by the process of obtaining weather/AIS information
- ☐ Did not know or was unable to find telephone or access numbers
- ☐ No telephone available
- ☐ No online access available
- ☐ Other (specify)_____

B.7 ..... Was the actual weather better than, the same as, or worse than forecast?

(Check one only in each category)

a.) Departure.....○ Better Than..... ○ Same As.....○ Worse
b.) En Route.....○ Better Than..... ○ Same As.....○ Worse
c.) Destination.....○ Better Than..... ○ Same As.....○ Worse

Section C. – In-Flight

C.1 ..... What type(s) of navigation and communication equipment were onboard the aircraft at the time of the incident, did you use it, and, if equipped, was any of it UN-serviceable/deferred? *(check all that apply)*

Communication

Equipment	Equipped	Used	UN-serviceable
No Communication Equipment	☐	☐	☐
Single VHF transceiver	☐	☐	☐
Dual VHF transceivers	☐	☐	☐
Combination NavCom	☐	☐	☐
HF transceiver	☐	☐	☐
ACARS	☐	☐	☐
Satellite Phone	☐	☐	☐
Cell phone	☐	☐	☐
Data link	☐	☐	☐
Other (specify)_____	☐	☐	☐

Navigation/Flight Management

No Navigation Equipment	☐	☐	☐
VOR Receiver(s)	☐	☐	☐
ADF	☐	☐	☐
DME	☐	☐	☐
GPS	☐	☐	☐
FMS/FMC	☐	☐	☐
INS/IRS	☐	☐	☐
Integrated area navigation	☐	☐	☐
Moving Map (portable, installed or integrated installed display)	☐	☐	☐
Other (specify)_____	☐	☐	☐

C.2 ..... What weather detection equipment, if any, was your aircraft equipped with during the incident?

Equipment	Equipped	Used	UN-serviceable
Weather Radar	☐	☐	☐
Lightning Detector/Stormscope	☐	☐	☐
Weather Data link	☐	☐	☐
Predictive windshear	☐	☐	☐
Enhanced Vision System (EVS)	☐	☐	☐
Other (specify)_____	☐	☐	☐

C.3 ..... What type of weather did you encounter?

- ☐ Convection
- ☐ Lightning
- ☐ Turbulence
- ☐ Icing
- ☐ Volcanic ash
- ☐ Winds (high, crosswind, or tailwind component)
- ☐ Density Altitude (pressure altitude & temperature)
- ☐ Temperatures (high or low)
- ☐ Cyclone
- ☐ Precipitation
- ☐ Clouds
- ☐ Visibility
- ☐ None

C.4……Do you believe the weather encountered was a contributing factor in the reported incident?

- ☐ Direct factor in the incident
- ☐ Increased workload
- ☐ Not a factor

C.5 ..... The weather encountered was:

- ○ Anticipated
- ○ Unexpected
- ○ Short notice/warning

C.6 ..... What type of NOTAM/TFR/SAA issues did you encounter?

- ☐ Lack of timeliness
- ☐ Incomplete information
- ☐ Information difficult to interpret
- ☐ Inaccurate information
- ☐ Weren't provided when requested
- ☐ Format issues

C.7 ..... If weather was encountered, at what altitude? _____

C.8 ..... During extended flight operations (Greater than 8 hours), did 'stale' weather or AIS information affect your flight?

- ○ Yes
- ○ No
- ○ Not applicable

C.9 ..... In-flight, did you attempt to obtain additional or new weather/AIS information pertaining to your flight?

- ○ Yes *(Continue to Question C.10)*
- ○ No *(Skip to Question C.11)*

C.10 .... If you answered "Yes" to Question C.9 above, what source(s) (human or system) provided your weather/AIS information in-flight?

- ☐ ATC Comm
- ☐ Dispatch/Company Operations via VHF voice
- ☐ Dispatch/Company Operations via ACARS data
- ☐ Dispatch / Company Operations via Satcom
- ☐ Satellite Phone (voice)
- ☐ Cell Phone (voice)
- ☐ Data link
- ☐ VOLMET Radio Stations (oceanic weather broadcast)
- ☐ Other pilots (by voice)
- ☐ Transcribed Weather Broadcasts (TWB)
- ☐ (Automated) Flight Service Stations / L-M
- ☐ Recorded AWOS/D-ATIS
- ☐ Hazardous In-flight Weather Advisory (HIWAS)
- ☐ En Route Flight Advisory Service (EFAS)
- ☐ WiFi (weather / AIS data via the internet)
- ☐ Flight Information Weather Services (FIS)
- ☐ Other (specify)_____

C.11 .... What weather sources would have been useful to prevent or reduce the likelihood of this incident occurring?

- ☐ ATC Comm
- ☐ Dispatch/Company Operations via VHF voice
- ☐ Dispatch/Company Operations via ACARS data
- ☐ Dispatch / Company Operations via Satcom
- ☐ Satellite Phone (voice)
- ☐ Cell Phone (voice)
- ☐ Data link
- ☐ VOLMET Radio Stations (oceanic weather broadcast)
- ☐ Other pilots (by voice)
- ☐ Transcribed Weather Broadcasts (TWB)
- ☐ (Automated) Flight Service Stations / L-M
- ☐ Recoreded AWOS/D-ATIS
- ☐ Hazardous In-flight Weather Advisory (HIWAS)
- ☐ En Route Flight Advisory Service (EFAS)
- ☐ WiFi (weather / AIS data via the internet)
- ☐ Other (specify)_____

Section D. – Data Link Weather/AIS Information

D.1 ..... Did you obtain data link weather or AIS information in-flight?

- ○ Yes (Continue to Question D.2)
- ○ No (Skip to Section E. – Consequences and Contributing Factors)

D.2 ..... In what format was the data link weather or AIS provided?

- ○ Text
- ○ Graphic
- ○ Both - Text and graphic
- ○ Data Direct entry into FMS

D.3 ..... What cockpit display was utilized to display the data link weather?

- ☐ Cell Phone / smartphone display
- ☐ EFB
- ☐ MFD
- ☐ ACARS text / alphanumeric text display
- ☐ Portable GPS
- ☐ Tablet computer (e.g., Apple iPad, Motorola Xoom, Blackberry PlayBook, etc.)

D.4 ..... On your display what software/application were you utilizing?

- ☐ ForeFlight
- ☐ WSI Inflight
- ☐ WxWorx
- ☐ Aviation Digital Data Service
- ☐ WingX
- ☐ PlaneBill
- ☐ Honeywell
- ☐ Wx Tap
- ☐ Unknown
- ☐ Other (specify)_____

D.5 ..... What weather information were you able to obtain via data link?

- ☐ Convection
- ☐ Lightning
- ☐ Turbulence
- ☐ Icing
- ☐ Volcanic ash
- ☐ Wind(high /crosswinds, tailwind component)
- ☐ Density Altitude (pressure altitude & temperature
- ☐ Temperature(high/low)
- ☐ Cyclone
- ☐ Precipitation
- ☐ Clouds
- ☐ Visibility
- ☐ None

D.6 ..... What AIS and/or MET information did you obtain via data link?

- ☐ NOTAMS
- ☐ Pre-flight information bulletins
- ☐ Radar images
- ☐ TAF/METAR
- ☐ SIGMET, AIRMET, PIREP
- ☐ Winds and/or Temperature Aloft
- ☐ Temporary Flight Restrictions (TFR)
- ☐ Special Use Airspace Status (SUA0
- ☐ Other _____

D.7 ..... How often do you use the system to obtain data link weather or AIS information?

_____%

D.8 ..... How would you rate your data link display /graphical user interface as far as being user-friendly?

- ○ Very user-friendly
- ○ Easy to learn and use with confidence
- ○ Complex and difficult but worth the investment of learning time
- ○ Moderately Complex
- ○ Very intricate and demanding

D.9 ..... Did you experience confusion with user interface and / or the associated functions while accessing data link weather / AIS information?

- ○ Yes *(Continue to Question D.10)*
- ○ No *(Skip to Question D.11)*

D.10 .... If you answered "Yes" to Question D9 above, please explain:

_____
_____
_____

D.11 .... Did your data link display provide information on signal integrity?

- ○ Yes
- ○ No
- ○ Not applicable

D.12 .... Were you aware of the time of last data received?

- ○ Yes
- ○ No
- ○ Not applicable

D.13 .... Did you experience data coverage issues while utilizing/obtaining data link weather/AIS information?

- ○ Yes *(Continue to Question D.14)*
- ○ No *(Skip to Question D.16)*

D.14 .... If you answered 'Yes" to Question D.13 above, what do you attribute the data coverage issue to?

- ☐ Weak Signal
- ☐ No Signal
- ☐ Too low - to obtain service (i.e., service volume coverage issue)
- ☐ Too high - co-channel interference issue
- ☐ Onboard Equipment Problem
- ☐ Other (specify) _____

D.15 .... Was an annunciation or alert associated with the loss of adequate signal?

- ○ Yes
- ○ No
- ○ Not applicable

D.16 .... What type of data link display was utilized?

- ○ Stand alone/Portable
- ○ Integrated
- ○ Other _____
- ○ Not Applicable

D.17 .... Was physical positioning of the display a concern?

- ○ Yes *(Continue to Question D.18)*
- ○ No *(Skip to Question D.19)*

D.18 .... If you answered "Yes" to Question D.17 above, identify contributory factors.

- ☐ Glare
- ☐ Contrast/Brightness
- ☐ Obstructions present?
- ☐ Mounting Concerns – e.g., increased rapid head movement

D.19 .... Do you believe having access to data link weather/AIS aided in better decision-making?

- ○ Yes
- ○ No

D.20 .... Did the image characteristics observed in-flight differ drastically to those viewed during your pre-flight?

- ○ Yes
- ○ No
- ○ Not applicable

D.21 .... Did you attend formal training to learn to utilize your data link display?

- ○ Yes
- ○ No

D.22 .... In conjunction with your training or purchase, were you issued a manual that highlighted the operation of your data link display system?

- ○ Yes
- ○ No

D.23 .... If yes to Question D.22 above, was the information in the manual easy to understand?

- ○ Yes
- ○ No

Section E. – Consequences and Contributing Factors

E.1..... Would enhanced (e.g. timely, less ambiguous, impact data versus MET data, more intuitive presentation) weather/AIS information helped in weather avoidance decision-making?

- ○ Yes
- ○ No
- ○ No opinion

E.2..... Did a diversion occur as a result of incomplete, inaccurate or misinterpreted weather/AIS information in-flight?

- ○ Yes
- ○ No

E.3..... Did a diversion occur after an approach was attempted?

- ○ Yes
- ○ No
- ○ Not applicable

E.4..... Was additional weather/AIS information available that you could not access?

- ○ Yes
- ○ No
- ○ Unable to determine

E.5..... Were there factors other than weather/AIS that contributed to this incident?

- ○ Yes *(Continue to Question E.6)*
- ○ No *(Skip to Question E.7)*

E.6..... If you answered "Yes" to Question E.5 above, what non-weather related factors contributed to the incident? (check all that apply)

- ☐ Company policy or procedures
- ☐ "Get-home itis"
- ☐ Aircraft equipment problem
- ☐ Fatigue
- ☐ Decision making
- ☐ Distraction
- ☐ Time pressure
- ☐ Illness
- ☐ Other _____

E.7..... What were the consequences of this weather encounter?

- ☐ Passenger Injury
- ☐ Crew Member Injury
- ☐ Aircraft Damage
- ☐ Pilot Deviation
- ☐ Go-around
- ☐ Escape Maneuver
- ☐ Airborne Conflict
- ☐ General Safety Concern
- ☐ CFTT
- ☐ Momentary Loss of Aircraft Control
- ☐ Other (specify) _____
- ☐ None

Section F. – Suggestions and Observations

F.1..... In your opinion would additional simulation of weather/AIS information hazards as part of simulator training/PC checks be valuable in future prevention of similar events?

- ○ Yes
- ○ No

F.2..... In your opinion would observational data from previous flight crews or station personnel at ground locations be useful?

- ○ Yes
- ○ No

F.3..... Please provide a few general observations on obtaining weather/AIS via data link inflight.

_____
_____
_____

F.4..... Why do you believe this incident occurred?

_____
_____
_____

F.5..... In retrospect, what would you have done differently to prevent this incident? (lessons learned)

_____
_____
_____

F.6..... Please provide any general comments.

_____
_____
_____

Appendix B

Supplemental Question Set (SQS) Answers

SQS Answers - Section A to E

Section A. – General Demographics

A.2 Flight phase where incident occurred

Preflight planning 1
Airport surface operations 0
Departure 2
En Route – domestic 13
En Route – remote area / polar route 1
En Route – oceanic 4
Descent 3
Approach 2
Landing 0
Number of Pilots Responded 26

Section B. – Preflight

B.1 Did you attempt to obtain weather and AIS information prior to your flight?

Yes 25
No 1
Number of Pilots Responded 26

B.2 If you answered "Yes" to Question B.1, what resources did you utilize to obtain pre-flight weather data?

The Weather Channel (or TV) 3
AFSS/FSS / Lockheed Martin 5
DUATS 2
Commercial Services 11
Mobile Applications 12
TWB 2
Information from other pilots 1
Dispatch/Company Ops 12
NOAA ADDS 8
Mountain Weather Cams 0
Other 4
Number of Pilots Responded 26

B.3 If you obtained weather information from an aviation weather source or a public weather source (e.g., television), did you experience confusion between the variation of symbols and/or colors?

Yes 1
No 20
Not Applicable 5
Number of Pilots Responded 26

B.4 Were any of your attempts to obtain preflight weather/AIS information unsuccessful?

Yes 1
No 25
Number of Pilots Responded 26

B.5 If you answered "Yes" to Question B.4 above, what were the reasons your attempts were unsuccessful?

Landline telephone / mobile telephone
- Did not know or were unable to find telephone or access numbers 0
- No telephone available/no signal 0
- No answer on telephone 0
- Telephone briefer did not have all requested information available 0
- Telephone briefer denied service 0
- Dispatch did not have all the requested information available 0
- Dispatch denied requested service 0
- Information provided via phone was too complex to copy 0

Computer / Smartphone / tablet computing devise
- No online access available 0
- Could not connect online 0
- Could not maintain online connection 0
- Experienced difficulty with computer interface 0
- Did not have computer in my possession 0

Onboard data link equipment
- Data link equipment malfunction 0
- Not within coverage volume of service 0
- Other 0

Number of Pilots Responded 0

B.6 Why did you decide not to obtain pre-flight weather/AIS information?

Did not believe pre-departure weather or AIS information was necessary for the intended flight 0
Was intimidated by the process of obtaining weather/AIS information 0
Did not know or was unable to find telephone or access numbers 0
No telephone available 0
No online access available 0
Other 0
Number of Pilots Responded 0

B.7 Was the actual weather better than, the same as, or worse than forecast?

Departure
- Better Than 0
- Same As 26
- Worse 0

En Route
- Better Than 0
- Same As 15
- Worse 11

Destination
- Better Than 0
- Same As 21
- Worse 5

Number of Pilots Responded 26

Section C. – In-flight

C.1 What type(s) of navigation and communications equipment were onboard the aircraft at the time of the incident, did you use it, and if equipped, was any of it UN-serviceable/deferred? (check all that apply)

Communication

Single VHF transceiver
- Equipped 1
- Used 1
- UN-Serviceable 0

Dual VHF transceiver
- Equipped 20
- Used 18
- UN-Serviceable 0

Combination NavCom
- Equipped 13
- Used 11
- UN-Serviceable 0

HF transceiver
- Equipped 10
- Used 4
- UN-Serviceable 1

ACARS
- Equipped 12
- Used 12
- UN-Serviceable 1

Satellite Phone
- Equipped 9
- Used 3
- UN-Serviceable 0

Cell Phone
- Equipped 3
- Used 0
- UN-Serviceable 1

Data Link
- Equipped 17
- Used 15
- UN-Serviceable 2

Other
- Equipped 3
- Used 2
- UN-Serviceable 0

Navigation/Flight Management

VOR Receiver(s)
- Equipped 16
- Used 7
- UN-Serviceable 0

ADF
- Equipped 13
- Used 2
- UN-Serviceable 0

DME
- Equipped 0
- Used 0
- UN-Serviceable 0

FMS/FMC
- Equipped 16
- Used 14
- UN-Serviceable 0

INS/IRS
- Equipped 9
- Used 8
- UN-Serviceable 0

Integrated area navigation
- Equipped 8
- Used 8
- UN-Serviceable 0

Moving Map/GPS
- Equipped 22
- Used 20
- UN-Serviceable 0

Other
- Equipped 2
- Used 2
- UN-Serviceable 0

Number of Pilots Responded 26

C.2 What weather detection equipment, if any, was your aircraft equipped with during the incident?

Weather Radar
- Equipped 17
- Used 10
- UN-Serviceable 0

Lightning Detector/Stormscope
- Equipped 9
- Used 3
- UN-Serviceable 0

Weather Data link
- Equipped 16
- Used 11
- UN-Serviceable 0

Predictive windshear
- Equipped 12
- Used 5
- UN-Serviceable 0

Enhanced Vision System
- Equipped 1
- Used 0
- UN-Serviceable 0

Other
- Equipped 1
- Used 1
- UN-Serviceable 0

Number of Pilots Responded 26

C.3 What type of weather did you encounter?

Convection 9
Lightning 4
Turbulence 9
Icing 1
Volcanic Ash 0
Winds 3
Density Altitude 0
Temperatures 0
Cyclone 2
Precipitation 8
Clouds 12
Visibility 1
None 0
Number of Pilots Responded 26

C.4 Do you believe the weather encountered was a contributing factor in the reported incident?

Direct factor in the incident 14
Increased workload 3
Not a factor 10
Number of Pilots Responded 26

C.5 The weather encountered was:

Anticipated 11
Unexpected 11
Short notice/warning 4
Number of Pilots Responded 26

C.6 What type of NOTAM/TFR/SAA issues did you encounter?

Lack of timeliness 4
Incomplete information 8
Information difficult to interpret 2
Inaccurate information 4
Weren't provided when requested 4
Format issues 3
Number of Pilots Responded 15

C.7 If weather was encountered, at what altitude?

70 1
390 1
2500 1
3000 1
6000 2
8000 1
10,000 1
11,500 1
12,000 1
FL260 1
FL350 1
FL370 1
FL380 1
Number of Pilots Responded 14

C.8 During extended flight operations (greater than 8 hours), did 'stale' weather or AIS information affect your flight?

Yes 1
No 6
Not applicable 19
Number of Pilots Responded 26

C.9 In-flight, did you attempt to obtain additional or new weather/AIS information pertaining to your flight?

Yes (Continue to C.10) 21
No (Skip to C.11) 5
Number of Pilots Responded 26

C.10 If you answered "Yes" to Question C.9 above, what source(s) (human or system) provided your weather/AIS information in-flight?

ATC Comm 5
Dispatch/Company Ops via VHF 1
Dispatch/Company Ops via ACARS 10
Dispatch/Company Ops via Satcom 1
Satellite Phone 0
Cell Phone 0
Data link 9
VOLMET 0
Other pilots 0
TWB 0
AFSS/FSS L-M 1
Recorded AWOS/D-ATIS 5
HIWAS 0
EFAS 0
WiFi 0
FIS 0
Other 3
Number of Pilots Responded 21

C.11 What sources would have been useful to prevent or reduce the likelihood of this incident occurring?

ATC Comm 6
Dispatch/Company Ops via VHF 2
Dispatch/Company Ops via ACARS 2
Dispatch/Company Ops via Satcom 0
Satellite Phone 1
Cell Phone 0
Data link 1
VOLMET 0
Other pilots 2
TWB 1
AFSS/FSS L-M 0

Recorded AWOS/D-ATIS....0
HIWAS....1
EFAS....0
WiFi....4
FIS....0
Other....8
Number of Pilots Responded....22

Section D. – Data Link Weather / AIS Information

D.1 Did you obtain data link weather or AIS information in-flight?

Yes (Continue to D.2)....18
No (Skip to Section E)....8
Number of Pilots Responded....26

D.2 In what format was the data link weather or AIS provided?

Text....7
Graphic....5
Both – text and graphic....5
Data Direct entry into FMS....0
Number of Pilots Responded....17

D.3 What cockpit display was utilized to display the data link weather?

Cell Phone/Smartphone Display....0
EFB....0
MFD....7
ACARS text....6
Portable GPS....6
Tablet Computer....0
Number of Pilots Responded....17

D.4 On your display what software/application were you utilizing?

ForeFlight....0
WSI Inflight....1
WxWorks....3
ADDS....0
WingX....0
PlaneBill....0
Honeywell....2
Wx Tap....0
Unknown....3
Other....5
Number of Pilots Responded....14

D.5 What weather information were you able to obtain via data link?

Convection....9
Lightning....6
Turbulence....7
Icing....5
Volcanic Ash....0
Winds....6
Density Altitude....2
Temperatures....5
Cyclone....0
Precipitation....12
Clouds....6
Visibility....5
None....1
Other....2
Number of Pilots Responded....15

D.6 What AIS and/or MET information did you obtain via data link?

NOTAMS....1
Pre-flight information bulletins....0
Radar images....8
TAF/METAR....10
SIGMET/AIRMET/PIREP....9
Winds and/or Temp Aloft....2
TFR....5
Special Use Airspace (SUA)....3
Other....2
Number of Pilots Responded....15

D.7 How often do you use the system to obtain data link weather or AIS information?

80%....2
90%....2
95%....1
100%....11
Number of Pilots Responded....16

D.8 How would you rate your data link display / graphical user interface as far as being user friendly?

Very user friendly....9
Easy to learn and use with confidence....6
Complex and difficult but worth the investment of learning time....1
Moderately Complex....1
Very intricate and demanding....0
Number of Pilots Responded....17

D.9 Did you experience confusion with user interface and/or the associated functions while accessing data link weather / AIS information?

Yes (Continue to D.10)....1
No (Skip to D.11)....17
Number of Pilots Responded....18

D.10 If you answered "Yes" to Question D9 above, please explain:

Number of Pilots Responded....1

Report 21: Normally, the data link function will provide ATIS for the arrival airport after takeoff. However, this time, for unknown reasons, the data link continued to display the ATIS for the departure airport during the arrival phase of the flight. Because of the way the message is formatted, the airport identifier is not immediately obvious (at a glance) on the ATIS report display.

D.11 Did your data link display provide information on signal integrity?

Yes....9
No....5
Not applicable....4
Number of Pilots Responded....18

D.12 Were you aware of the time of data last received?

Yes....13
No....3
Not applicable....2
Number of Pilots Responded....18

D.13 Did you experience data coverage issues while utilizing/ obtaining data link weather/AIS information?

Yes (Continue D.14)....2
No (Skip D.16)....16
Number of Pilots Responded....18

D.14 If you answered "Yes" to Question D.13 above, what do you attribute the data coverage issue to?

Weak Signal....1
No Signal....0
Too low – to obtain service....0
Too high – co-channel interference....0
Onboard Equipment Problem....1
Other....0
Number of Pilots Responded....2

D.15 Was an annunciation or alert associated with the loss of adequate signal?

Yes....1
No....1
Not applicable....0
Number of Pilots Responded....2

D.16 What type of data link display was utilized?

Stand alone/Portable....6
Integrated....9
Other....1
Not applicable....2
Number of Pilots Responded....18

D.17 Was physical positioning of the display a concern?

Yes (Continue D.18)....1
No (Skip D.19)....17
Number of Pilots Responded....18

D.18 If you answered "Yes" to Question D.17 above, identify contributing factors.

Glare....0
Contrasts/Brightness....0
Obstructions....0
Mounting Concerns....1
Number of Pilots Responded....1

D.19 Do you believe having access to data link weather/AIS aided in better decision-making?

Yes....16
No....2
Number of Pilots Responded....18

D.20 Did the image characteristics observed in-flight differ drastically to those viewed during your pre-flight?

Yes....5
No....9
Not applicable....4
Number of Pilots Responded....18

D.21 Did you attend formal training to learn/utilize your data link display?

Yes....7
No....11
Number of Pilots Responded....18

D.22 In conjunction with your training or purchase, were you issued a manual that highlighted the operation of your data link display system?

Yes....16
No....2
Number of Pilots Responded....18

D.23 If yes to Question D.22 above, was the information in the manual easy to understand?

Yes....15
No....1
Not Applicable....0
Number of Pilots Responded....16

Section E. – Consequences and Contributing Factors

E.1 Would enhanced weather/AIS information have helped in weather avoidance decision-making?

Yes....17
No....6
No opinion....3
Number of Pilots Responded....26

E.2 Did a diversion occur as a result of incomplete, inaccurate or misinterpreted weather/AIS information in-flight?

Yes....7
No....19
Number of Pilots Responded....26

E.3 Did a diversion occur after an approach was attempted?

Yes....1
No....22
Not applicable....3
Number of Pilots Responded....26

E.4 Was additional weather/AIS information available that you could not access?

Yes....10
No....11
Unable to determine....5
Number of Pilots Responded....26

E.5 Were there factors other than weather/AIS that contributed to this incident?

Yes (Continue E.6)....15
No (Skip E.7)....11
Number of Pilots Responded....26

E.6 If you answered "Yes" to Question E.5 above, what non-weather related factors contributed to the incident?

Company policy or procedures....4
"Get-home-itis"....1
Aircraft Equipment Problem....2
Fatigue....0
Decision making....2
Distraction....1
Time pressure....1
Illness....0
Other....10
Number of Pilots Responded....14

E.7 What were the consequences of this weather encounter?

Passenger injury....0
Crew Member Injury....1
Aircraft Damage....0
Pilot Deviation....6
Go-around....1
Escape Maneuver....1
Airborne Conflict....0
General Safety Concern....8
CFTT....0
Momentary Loss of Aircraft Control....2
Other....8
None....7
Number of Pilots Responded....26

Section F. – Suggestions and Observations

F.1 In your opinion would additional simulation of weather/AIS information hazards as part of simulator training/PC checks be valuable in future prevention of similar events?

Yes....8
No....18
Number of Pilots Responded....26

F.2 In your opinion would observational data from previous flight crews or station personnel at ground locations be useful?

Yes....10
No....14
Number of Pilots Responded....24

SQS Answers - Section F

Section F. – Suggestions and Observations

Questions:

F.1 In your opinion would additional simulation of weather/AIS information hazards as part of simulator training/PC checks be valuable in future prevention of similar events?

F.2 In your opinion would observational data from previous flight crews or station personnel at ground locations be useful?

F.3 Please provide a few general observations on obtaining weather/AIS via data link inflight.

F.4 Why do you believe this incident occurred?

F.5 In retrospect, what would you have done differently to prevent this incident? (lessons learned)

F.6 Please provide any general comments.

Report 1

F.1 No

F.2 No

F.3 [No answer provided.]

F.4 The cells I attempted to deviate through formed a solid line faster than anticipated.

F.5 Went with my first instinct and deviate completely around the weather, which has always been my practice, if able. And not to let co-pilot's opinions affect my decision making, when I wasn't comfortable initially with attempting to pick through the cells.

F.6 [No answer provided.]

Report 2

F.1 No

F.2 No

F.3 [No answer provided.]

F.4 A change of Route by ATC and new procedures ended up monopolizing the ACARS so that required weather reports were not obtained when required.

F.5 Reverted to SATCOM or HF to obtain the info. But those methods are time consuming.

F.6 [No answer provided.]

Report 3

F.1 No

F.2 Yes

F.3 My company refuses to provide SIGMETs for area of concern, refuses to provide runway conditions in winter, they state that they are not required by law to provide any enroute weather

F.4 failure of airline to care about safety

F.5 nothing we can do as even the SATCOM is locked out of acquiring weather from other sources in industry that do care about safety

F.6 Safety Reporting means nothing to this airline, accelerated efforts in place to defy law and aviation science by management

Report 4

F.1 Yes

F.2 Yes

F.3 An amazing addition to pilot comfort in WEATHER assessment, and easy choice of successful WEATHER deviation in this case.

F.4 We had viable WEATHER backup plans (land at KWJF), and consider this experience an example of the value of data link in aiding successful safe flight

F.5 See F.4, data link avoided any risk or concern of an "incident"

F.6 If data link WEATHER is made available for future ATC using GPS to replace radar separation, many more GA pilots would embrace it and equip their planes with it.

Report 5

F.1 Yes

F.2 Yes

F.3 works well when network is not saturated

F.4 poor dispatch support yielded less than optimum WEATHER info

F.5 demanded better dispatch support before signing the release

F.6 [No answer provided.]

Report 6

F.1 No

F.2 Yes

F.3 Real time satellite imagery of the weather on the tracks would be very useful during the flight.

F.4 1. Natural phenomenon - solar storm - negatively impacted HF capability

2. ATC (oceanic) contingency procedures conflicted with safety requirements to avoid buildups

3. ATC (oceanic) reactive rather than proactive in weather avoidance

F.5 Nothing. Priorities are “Aviate, Navigate, Communicate”. ATC removed the only viable options without resorting to exercising emergency authority.

F.6 Modify and update oceanic contingency procedures to reflect operational realities regarding the unpredictability and uncertainty of weather deviations when climb or descent is denied.

Report 7

F.1 No

F.2 Yes

F.3 Indispensable for non-local flights. Second only to becoming instrument rated in terms of safety/$$$ ratio. Used for VMC as much as for IMC. Greatly increases utility of aircraft. It’s one of those “cold, dead hands” items now.

F.4 Unknown. “Satellite Mosaic” has always accurately depicted any significant cloud cover. This time it showed none within 40nm radius but scattered coverage outside that area. Unit was functioning properly; satellite data for that local area was inaccurate.

F.5 Nothing. Destination airport was not in sight and undercast was becoming solid, so I descended through a break, landed, and consulted with NWS analysts on field. Their satellite images showed no cloud cover either, despite the obvious ceiling visible through their windows. Departed VFR under solid cloud deck, which became CAVU 25nm later. Landed at destination in severe clear. No personal minima were exceeded.

F.6 Please clarify “impact data vs. MET info”.

Report 8

F.1 No

F.2 [No answer provided.]

F.3 The ‘incident’ here was that some relatively-minor but unexpected precipitation (and minor convective cloud buildup) appeared en route, both in the actual sky, on the stormscope, and on my MFD display. While diverting course (moderately and fairly ‘routinely’) to stay out of the clouds and the MFD-indicated precipitation, the weather graphics overlaying the MFD screen (MX20 and Garmin530) covered up / obscured the airspace markings delineating a restricted airspace. My diversions took me into that airspace. I called the governing “approach” authority immediately and there were no other repercussions.

F.4 I focused too much on the graphic weather screens. Obviously the MFD (MX20 and Garmin 530) had other screens that would have shown the airspace borders without any weather on them. The combined overlay (weather on same screen as navigation/airspace) is usually a GREAT and useful screen, but in this case it wasn’t the best choice.

F.5 See above. Also, had I requested and been on flight following, they would have warned me. But, wisely or not, I tend to AVOID flight following in situations where I’m frequently changing direction and altitude.

F.6 The electronics in a plane like ours are usually great -- they beep and flash to warn of all sorts of major and minor concerns. I’m not sure why it isn’t built into the G530 to give some sort of warning when you’re headed into restricted airspace. (If there IS such a warning, it obviously wasn’t something that I understood or that got my attention).

Report 9

F.1 No

F.2 No

F.3 [No answer provided.]

F.4 Human error in reading TFR information. Not backing up information on internet with a phone call to FSS.

F.5 Called FSS as a backup to the information I found on the internet. Open up the IFR flight plan I filed instead of going VFR, or at least get flight following from ATC. Use all tools at my disposal.

F.6 [No answer provided.]

Report 10

F.1 Yes

F.2 Yes

F.3 At the time of the incident the weather information was delayed. Right after the incident the update showed we had flown into a strong cell area.

F.4 Rapidly developing weather that was greater than forecast.

F.5 Delayed flight into this region or changing of the route to the North.

F.6 Very scary incident with faith in weather information now being questioned.

Report 11

F.1 No

F.2 No

F.3 [No answer provided.]

F.4 Poor WSI weather forecast. They amended the NWS forecast and removed the convective weather potential.

F.5 Will be looking for other sources of weather than just our dispatch/airline provided weather product.

F.6 [No answer provided.]

Questions:

F.1 In your opinion would additional simulation of weather/AIS information hazards as part of simulator training/PC checks be valuable in future prevention of similar events?

F.2 In your opinion would observational data from previous flight crews or station personnel at ground locations be useful?

F.3 Please provide a few general observations on obtaining weather/AIS via data link inflight.

F.4 Why do you believe this incident occurred?

F.5 In retrospect, what would you have done differently to prevent this incident? (lessons learned)

F.6 Please provide any general comments.

Report 12

F.1 No

F.2 No

F.3 [No answer provided.]

F.4 Co-located restricted areas R5311A, B, C does not present itself on moving map displays, in my opinion, very well.

F.5 Fly around the lateral limits of restricted airspace and not above unless specifically cleared by ATC.

F.6 [No answer provided.]

Report 13

F.1 No

F.2 No

F.3 Being able to get information via data link is a wonderful thing.

F.4 Known programming issue with our new flight planning software.

F.5 Not ask for SIGMETs enroute using ACARS.

F.6 1. Our new flight planning software only provides SIGMETs with the flight planning information if it impacts the flight. What the definition of that is I do not know. I do know that flying out of ORD to FRA the other day over Lake Michigan via SSM that there were no SIGMETS for our flight even though there were SIGMETs for over Michigan for turbulence. The question then is how far away from the planned route does the weather have to be for the pilots to be made aware of it?

2. In talking to the "experts" on our flight planning software the problem with the SIGMETs provided in flight (28 minutes of SIGMETs that I did not need) is a known problem discovered during testing that just hasn't been a priority to fix.

3. The loss of ACARS access while large documents are being downloaded and printed out (such as a new flight plan, worldwide SIGMETs, etc.) is a continuing problem. Once it starts there is nothing you can do to stop or over ride it if you don't want it.

Report 14

F.1 No

F.2 [No answer provided.]

F.3 A display of actual weather at the destination airport that was being observed on RADAR at the time repeated and displayed in the flight deck would of helped depict the actual weather at the time

F.4 The pilots did not comprehend the intensity of the weather until at the beginning of the approach when Anchorage Center informed us of the severity of the weather. Then a quick check with Dispatch confirmed the weather. Dispatch informed us it was only a forecast and there were no PIREPs to confirm. So Dispatch told us we were to continue to destination in question.

F.5 By seeing a ground RADAR return confirming the severe weather at the time, would of prevented the approach attempt

F.6 After entering the severe weather, the severe weather was confirmed on the aircraft weather RADAR, and the decision was made to abandon the approach and execute the missed approach and exit the severe weather we were encountering.

Report 15

F.1 Yes

F.2 Yes

F.3 It's a good system easy to use and understand just don't know why it did not depict the TFR.

F.4 Multiple reasons.

1. No mention of the TFR affecting the departure airport when receiving briefing from fltplan.com

2. My misunderstanding in communication with ATC when flying into the airport

3. TFR fail to display on the MFD through the data uplink.

F.5 If a TFR is close to departure airport call ATC to verify any procedures that need to be done prior to departure.

F.6 [No answer provided.]

Report 16

F.1 Yes

F.2 Yes

F.3 In flight satellite weather - I have used both WSI and now WxWorx - is invaluable. However, possibly due to transmission delays, NEXRAD sometimes inaccurately positions weather. That is why visual avoidance, onboard radar, and Stormscope are valuable.

F.4 On board NEXRAD weather showed precipitation along the path of the runway 11R IAP, and west of VRB airport. ATC vectored me for the 11R IAP with expected circle to land runway 04. ATC declined to clear me for runway 04 IAP, though I told the reason for the request. ATC claimed several planes on the approach, so I offered and accepted a 360 degree delaying circle well to the NW of the field.

When ATC again cleared me to the IAF for Runway 11R approach as I now had VRB visually still well to the Northeast, I requested a visual approach - permissible as the field was VRF.

ATC still persisted in vectoring me counterclockwise almost 270 degrees about 5nm about the field. This placed me though the intermediate segment of the 11R approach, and into the weather I requested and wished to avoid. When finally cleared for a visual approach, now well SW of the airport, visibility was poor, and a visual approach was now dicey. Was not asked about weather conditions ever while aloft, only after landing ground control requested a report of weather to the southwest.

F.5 Should have told ATC "No, I won't go because of weather I am seeing on NEXRAD." The fact other planes were being so vectored though it should not have been a factor.

F.6 This questionnaire applies poorly to the situation I reported to ASRS. My difficulty was ATC and my lack of firmly declining a clearance - not a problem with in-cockpit weather.

Report 17

F.1 Yes

F.2 Yes

F.3 Thanks to data link and advances in GPS (especially WAAS and moving maps), we now have the best tools I've seen for improving safety since I started flying in the 1960's. I'm looking forward to receiving even more useful data through NexGen. I would especially like to see an ACARS-like feature so that GA pilots can retrieve (and preferably be able to print out) ATIS broadcasts, PDCs, more timely METAR data and (ultimately) ATC clearances.

F.4 WEATHER was only tangentially related to this incident... the downlink radar showed WEATHER moving towards my destination faster than expected, causing me to divert as a precaution. The incident I reported was an apparent communications problem within ATC...Center cleared me to my diversion airport, but Approach didn't get the word and thought I was still headed to my original destination.

F.5 Made clear on initial call to Approach that I was diverting.

F.6 Thanks for all the hard work on aviation safety.

Report 18

F.1 No

F.2 No

F.3 [No answer provided.]

F.4 I believe the winds we uploaded were corrupt/bad. I don't know why this happened and I don't know if the winds from 6 hours later were the same or better.

F.5 I couldn't have done anything differently...

F.6 [No answer provided.]

Report 19

F.1 No

F.2 No

F.3 Turbulence information may or may not be put into the system by the dispatcher. Up to their individual discretion or workload. I have at times provided very detailed "ride reports" via ACARS to our dispatch and had them never show up when "PIREPS" requested over ACARS.

F.4 Lack of priority in addressing the software issue or in providing weather information to the crews.

F.5 Never asked for the SIGMETS since I lost ACARS for 28 minutes.

F.6 I fly internationally for the most part. I have seen turbulence forecast (most often correctly forecasted) when United weather products did not show it. When dispatchers queried about it during preflight the normal response is that they only use the United (ENSCO) products and don't have time to review any others.

Report 20

F.1 No

F.2 No

F.3 Data from ACARS helpful but showed us west of CAT box. Altitudes of previous aircraft encounters started much lower than our initial encounter.

F.4 Weather phenomenon occurred in more widespread area than forecast.

F.5 Demanded flight attendants take seats ASAP instead of providing a warning of turbulence anticipated in descent.

F.6 Turbulence encounter was not significant on flight deck. Must have been much worse in aft cabin to knock flight attendant off balance. The operations manual allows flight attendants to be up during light encounters like this one.

Questions:

F.1 In your opinion would additional simulation of weather/AIS information hazards as part of simulator training/PC checks be valuable in future prevention of similar events?

F.2 In your opinion would observational data from previous flight crews or station personnel at ground locations be useful?

F.3 Please provide a few general observations on obtaining weather/AIS via data link inflight.

F.4 Why do you believe this incident occurred?

F.5 In retrospect, what would you have done differently to prevent this incident? (lessons learned)

F.6 Please provide any general comments.

Report 21

F.1 No

F.2 No

F.3 In general, it's much safer to obtain weather info via datalink, than via traditional methods (i.e. ATIS broadcast), since one pilot is not required to leave the ATC frequency to obtain ATIS.

F.4 Primarily, distraction caused by a conversation in the cockpit. However it was compounded by failure of the data link software on this day to operate in the way we're used to seeing it (delivering departure ATIS before takeoff/arrival ATIS after takeoff.)

F.5 Read the message header more closely, and make sure the ATIS displayed is for the correct (arrival) airport.

F.6 [No answer provided.]

Report 22

F.1 Yes

F.2 No

F.3 It is a remarkable tool. I use it when flying my personal Piper Saratoga as well as in the two Citation Jets I fly for work. It is a great planning tool especially when planning a descent into a destination airport and weather is a consideration.

F.4 My failure to accept the information as "advisory" and actually use it as a "tactical" tool. I also failed to properly interpret and recognize the age of the data and its deficiency considering the rapid development of the air mass thunderstorms

F.5 I now better understand the deficiency / limitations of the radar data, especially in dealing with air mass thunderstorms. I should have kept a safer distance from the known weather and trusted my eyes and experience and not entered the area that was developing faster than the updates on the data link could depict.

F.6 I still travel with a Garmin 396 in my personal aircraft and a Garmin 696 in the jets I fly for my job. The data it provides is very important in planning and decision making. It is, however, important to understand the limitations of the equipment especially the radar pictures and how summertime air mass thunderstorms can build rapidly - more rapidly than anything other than airborne radar can depict and it even has it's limitations due to attenuation. Bottom line: remember the safe distance rules from these thunderstorms. My experience was probably a worst case scenario. The ATC controllers and a respected meteorologist were all impressed with the rate of development of these particular storms. However, that would not have eased the grief at my funeral had I not responded appropriately and maybe had a little luck. Certainly, ATC played a big role in helping guide me through it once I encountered IMC and lost any visual clue as to which way to go. After I exited the danger, the XM data link updated and finally depicted an accurate, and sobering, depiction of the convective activity I encountered.

Report 23

F.1 No

F.2 No

F.3 The weather information was available during preflight. I saw it and questioned the wisdom of the route. Dispatch accepted the SABRE most efficient flight plan and stated that the weather would not be a problem because, in his words, "These storms don't get as high in November as they do in the summer". I disagreed.

F.4 Dispatch was too willing to accept a SABRE generated route regardless of the WEATHER and turbulence possibilities. Before we even reached cruise altitude the dispatcher was contacting us via ACARS to suggest that we ask for a reroute for weather avoidance.

F.5 Nothing. I added additional fuel and deviated around the enroute weather the same way that I have been doing for many years. There was no real incident other than a flight planning system picking a route regardless of enroute weather.

F.6 Computers are wonderful tools for planning but they can't think. That's why we have human dispatchers and pilots. We need to make sure that we continue to do so.

Report 24

F.1 No

F.2 No

F.3 [No answer provided.]

F.4 TFR data did not download before takeoff.

F.5 Confirm complete download of TFR and WEATHER information before takeoff.

F.6 [No answer provided.]

Report 25

F.1 No

F.2 No

F.3 Not a weather issue

F.4 CPDLC communication issue with ATC

F.5 Confirm on HF the CPDLC data link established.

F.6 [No answer provided.]

Report 26

F.1 Yes

F.2 Yes

F.3 The information displayed is several minutes old. if weather is changing quickly, data link should be used to avoid an area and not pick thru.

F.4 Turbulence and up and down drafts.

F.5 Flown a different course to avoid the area.

F.6 Data link is good for what it does. sometimes you see the same as on the display and then you can be in weather that's is not displayed yet. that's what happened in this case.

Appendix C

Data Summary of ASRS Analyst Coding Form and Synopses

ASRS Analyst Coding

Time of Day

0001-0600 4
0601-1200 8
1201-1800 11
1801-2400 3
Left Blank 0

Lighting

Daylight 15
Night 5
Left Blank 6

Flight Conditions

IMC 4
Mixed 2
VMC 9
Left Blank .....

Operator

Air Carrier 12
Corporate 1
Government 1
Personal 12
Left Blank 0

Aircraft Make/Model

A320 1
B737 3
B747 1
B777 2
Bonanza 36 2
Cessna 340/340A 1
Commercial Fixed Wing 5
M20K 1
Piper 28, Cherokee/Archer 1
Piper 32, Lance/Saratoga 1
Piper 60, Aerostar 1
Pilatus PC12 1
Cessna 172, Skyhawk 1
Cessna 182, Skylane 1
Small Aircraft, Low Wing, 2 Engine 1
Small Transport, Low Wing, Turboprop 1
Cirrus SR22 1
TBM 700/TBM 850 1

Crew Size

One 13
Two 6
Three 2
Left Blank 5

FAR Part

Part 121 11
Part 91 14
Left Blank 1

Operational Mission

Ferry 1
Passenger 13
Personal 12
Left Blank 0

Flight Phase

Cruise 14
Descent 2
Initial Approach 2
Initial Climb 2
Landing 1
Parked 3
Left Blank 2

Route in Use

Direct 11
Oceanic 2
Vectors 2
STAR 1
Left Blank 10

Operator

Air Carrier 12
Corporate 1
Government 1
Personal 12
Left Blank 0

Primary Problem

Aircraft 2
Ambiguous 10
Human Factors 6
Weather 8
Left Blank 0

Time in Type

12 1
30 1
150 1
200 1
250 1
400 1
500 1
670 1
1000 1
1308 1
1600 1
1700 1
2000 1
2450 1
3000 1
3100 1
4000 2
4122 1
4600 1
5000 1

Time in Last 90 Days

20 1
21 1
25 1
27 1
30 1
35 1
45 1
50 1
60 1
65 2
90 1
100 1
120 2
150 3
215 1
233 1
240 1

Total Time

630 1
750 2
800 1
1000 1
1993 1
3000 1
3300 1
4015 1
4400 1
5000 1
5500 1
6000 1
6700 1
14100 1
14139 1
15000 2
18000 1
19000 1
27000 1

Qualification

ATP 16
Instrument 4
Multi Engine 6
CFI 5

Commercial 4
Instrument 4
Multi Engine 3

Private 4
Instrument 4
Rotorcraft 1

Flight Engineer 1

Function

Captain 8
First Officer 3
Relief Pilot 1
Instructor 1
Single Pilot 13

Anomaly

Aircraft Equipment Problem – Less Severe 5
Inflight Encounter - Weather/Turbulence 16
Deviation – Clearance 4
Deviation - Published Material/Policy 6
Deviation – Track or Heading 2
Deviation – Procedural Other 3
Inflight Fuel Issue 1
Loss of Aircraft Control 3
Excursion from Assigned Altitude 5
Procedural Deviation – FAR 4
VFR in IMC 1
ATC Issues 2
Airspace Violation 4
Flight Deck/Cabin/Aircraft Event Other 1
Altitude Overshoot 1

Result

Air Traffic Control Issued New Clearance 7
Air Traffic Control Provided Assistance 4
Air Traffic Control Issued Advisory/Alert 6
Flight Crew Regained Aircraft Control 3
Flight Crew Returned to Clearance 3
Flight Crew Requested ATC Assistance 2
Flight Crew Landed as a Precaution 1
Flight Crew Diverted 5
Flight Crew Took Evasive Action 4
Flight Crew Became Reoriented 3
Flight Crew Exited Penetrated Airspace 1
Flight Crew Executed Go Around 1
None Reported / Taken 7

ASRS Analyst Synopses

Report 1

A PC12 pilot inadvertently entered a building thunderstorm despite the use of weather radar and a digital weather display system. Loss of control and extended altitude deviations ensued.

Report 2

Air carrier First Officer describes delays in receiving a revised flight plan over ACARS that results in crossing 50W prior to receiving weather, and sending the acceptance message.

Report 3

C182 pilot departs HTO under VFR and expects to remain VFR to TEB. IMC is encountered shortly after takeoff and ATC assistance is required to divert to an airport with VMC.

Report 4

M20 pilot describes using weather data link during preflight and enroute to successfully avoid thunderstorms in the Owens Valley of California.

Report 5

An air carrier Captain reported he was unable to downlink winds at the gate or in the air, resulting in an FMS error message.

Report 6

Captain exercises his emergency authority to deviate around a thunderstorm on the North Atlantic Tracks, after a request to Shanwick Oceanic via CPDLC is denied. Shanwick indicated that a loss of standard separation occurred during this incident.

Report 7

C172 pilot experiences invalid cloud cover information received through XM/WX displayed on a Garmin 496. No cloud cover was displayed while solid under cast existed.

Report 8

BE36 pilot reports inadvertent restricted airspace incursion while attempting to deviate around build-ups using XM weather. The weather depiction obliterated the airspace boundaries on both the MX20 and the G530.

Report 9

C340 pilot reports missing a NOTAM establishing a TFR along his VFR route of flight.

Report 10

An IFR PA-28 pilot entered an undetected thunderstorm cell and temporarily lost control in turbulence. After exiting the cell he regained control and diverted to his alternate airport.

Report 11

B737 Captain reports encountering unforecast convective weather upon arrival at MIA. Runway 9 is requested for landing and windshear is encountered at 1,000 FT during approach. A normal landing ensues.

Report 12

The pilot of a light twin is informed after landing that he has flown through R-5311B. The Garmin GPS units that were being used for navigation showed the upper limit of the airspace as 7,000 FT and the reporter was at 10,500 FT.

Report 13

Air Carrier First Officer reports that the flight planning software provides only SIGMETS that are 'applicable' to the flight. Requesting SIGMETS in flight can tie up the ACARS for extended periods of time.

Report 14

B737-400 flight crew reports executing a missed approach from 2,500 FT due to moderate turbulence and heavy rain then continuing the climb above missed approach altitude, without clearance, to get out of the weather. Upon checking in with Center they are admonished for doing so.

Report 15

The pilot of a light twin reports being diverted to BVU after filing an IFR flight plan to LAS, due to a VIP TFR over LAS. The reporter departs two hours later intending to pick up his IFR clearance airborne and is informed he has violated the TFR. The aircraft was equipped with a Garmin 880 MFD which did not display the TFR.

Report 16

TBM7 pilot arriving VRB learns from ATIS that Runway 11R approach is in use with a circle to land Runway 4. NEXRAD and on-board radar show weather on the 11R approach and the reporter requests the Runway 4 GPS approach. Other traffic arriving VRB results in delaying vectors and flight through the weather the reporter wished to avoid.

Report 17

BE36 pilot reports requesting a diversion to BHM due to weather approaching his intended destination, which is granted. Upon switching to BHM Approach, it becomes increasingly apparent that the Controller is not aware of the planned diversion until the field is reported in sight.

Report 18

Air carrier Captain en route to ZSPD reports updating the FMC winds, which results in 30 minutes added to the ETA and 6,000 LBS less fuel at touch down. As the flight progresses, the ETA and fuel score gradually return to their pre-update values.

Report 19

An air carrier First Officer believes that the turbulence reports provided to the company by a commercial weather service do not show the severity of turbulence as depicted on U.S. and Canadian government charts. Man power in the Dispatch department has been recently been reduced.

Report 20

A320 flight crew reports encountering turbulence, which is the subject of a SIGMET. The seatbelt sign is turned on and the flight attendants are asked to be seated prior to encountering moderate turbulence. On a subsequent leg, a Flight Attendant reports that he was injured by this turbulence.

Report 21

B737-700 flight crew reports distractions and omissions during descent on the HONIE arrival into ATL resulting in descent below assigned altitude. ACARS ATIS update function had retrieved information from the departure airport, which resulted in an incorrect altimeter setting, and a conversation with the Jumpseater delayed completion of the Descent Checklist.

Report 22

PA32 pilot reports entering a rapidly building thunderstorm while attempting to use XM Radar to navigate around, with ATC concurrence.

Report 23

Air Carrier Captain laments the route planning of the new flight planning software in regards to enroute weather, and the time it takes to print on the printers available to the flight crew's.

Report 24

SR22 pilot departing ILG reports possibly entering the VIP TFR 5 NM north during departure. G1000 MFD did not display the TFR until the reporter was inside the lateral boundary.

Report 25

B777 flight crew reports not receiving a VHF frequency for ZNY via CPDLC prior to departing the WATRS area northbound. It is discovered that they are not logged onto CPDLC and have not been since entering BDA TMA.

Report 26

Aerostar pilot reports encountering heavy rain at 7,000 FT on an IFR flight plan. A turn, with ATC permission, using weather data link information is made to avoid the worst. Turbulence results in a loss of 500 FT with full power set before 7,000 FT can be regained.